

GONTKEVICH, V.S., aspirant

Determining natural frequencies of bending vibrations of slightly-twisted plates. Izv.vys.ucheb.sav.; mashinostr. no.9:19-29 '61. (MIRA 14:12)

1. Akademiya nauk USSR.  
(Elastic plates and shells--Vibration)

GONTKEVICH, V.S.

Effect of the yielding of the fastening of a cantilever plate on  
its natural vibration frequencies. Sbor.trud.Lab.gidr.mash. no.9:  
69-76 '61. (MIRA 15:3)

(Elastic plates and shells--Vibration)

GONTKEVICH, U.S.

BOROVSKIY, P. V.

PHASE I BOOK EXPLOITATION

SOV/6206 25

Konferentsiya po teorii plastin i obolochek. Kazan', 1960.

Trudy Konferentsii po teorii plastin i obolochek; 24-29 oktyabrya 1960. (Transactions of the Conference on the Theory of Plates and Shells Held in Kazan', 24 to 29 October 1960). Kazan', [Izd-vo Kazanskogo gosudarstvennogo universiteta] 1961. 426 p. 1000 copies printed.

Sponsoring Agency: Akademiya nauk SSSR. Kazanskiy filial. Kazanskiy gosudarstvennyy universitet im. V. I. Ul'yanova-Lenina.

Editorial Board: Kh. M. Mushtari, Editor; P. S. Isanbayeva, Secretary; N. A. Almyas, V. V. Bolotin, A. S. Vol'mir, N. S. Ganiyev, A. L. Gol'denveyzer, N. A. Kil'chevskiy, M. S. Kornishin, A. I. Lur'ye, G. N. Savin, A. V. Sachenkov, I. V. Svirskiy, R. G. Surkin, and A. P. Filippov. Ed.: V. I. Aleksagin; Tech. Ed.: Yu. P. Semenov.

PURPOSE: The collection of articles is intended for scientists and engineers who are interested in the analysis of strength and stability of shells.

Card 1/14

## Transactions of the Conference (Cont.)

SOV/6206 75

COVERAGE: The book is a collection of articles delivered at the Conference on Plates and Shells held in Kazan' from 24 to 29 October 1960. The articles deal with the mathematical theory of plates and shells and its application to the solution, in both linear and nonlinear formulations, of problems of bending, static and dynamic stability, and vibration of regular and sandwich plates and shells of various shapes under various loadings in the elastic and plastic regions. Analysis is made of the behavior of plates and shells in fluids, and the effect of creep of the material is considered. A number of papers discuss problems associated with the development of effective mathematical methods for solving problems in the theory of shells. Some of the reports propose algorithms for the solution of problems with the aid of electronic computers. A total of one hundred reports and notes were presented and discussed during the conference. The reports are arranged alphabetically (Russian) by the author's name.

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S/879/62/000/000/048/088  
D234/D308

AUTHOR: Gontkevich, V. S. (Khar'kov)

TITLE: Natural vibrations of cylindrical shells of variable thickness

SOURCE: Teoriya plastin i obolochek; trudy II Vsesoyuznoy konferentsii, L'vov, 15-21 sentyabrya 1961 g. Kiev, Izd-vo AN USSR, 1962, 295-299

TEXT: The author considers axially symmetric vibrations of shells whose thickness is variable along the meridian. If the thickness is not equal to zero at the edge, calculation with the usual formulas becomes difficult, and it is preferable to substitute

$y = (\lambda_m x^{1-n/2}) / (1-n/2)$ : then the solution of the differential equation of the problem tends asymptotically to that of

$$\frac{\partial^4 w}{\partial y^4} - w = 0 \quad (5)$$

Card 1/2

Natural vibrations of ...

S/879/62/000/000/048/088  
D234/D308

For natural frequencies of asymmetric vibration a formula is deduced using Rayleigh's principle.

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GONTKEVICH, V.S.

Natural vibrations of rising cylindrical shells. Sbor.trud.Lab.gidr.  
mash.AN URSR no.10:27-37 '62. (MIRA 15:12)  
(Elastic plates and shells--Vibration)



GONTKEVICH, V.S. (Khar'kov)

Natural vibrations of flat cylindrical shells. Stroi.mekh.1  
rasch.soor. 5 no.2:32-35 '63. (MIRA 16:6)  
(Elastic plates and shells) (Vibration)

GONTKEVICH, V.S. [Hontkevych, V.S.] (Khar'kov)

Natural vibrations of closed cylindrical shells under variable boundary conditions. *Pril.mekh.* 9 no.2:216-220 '63. (MI<sup>KA</sup> 16:3)

1. Laboratoriya gidravlicheskikh mashin AN UkrSSR.  
(Elastic plates and shells—Vibration)

GONTKEVICH, V.S.

Natural vibrations of noncircular cylindrical shells. Trudy Lab.gidr.  
mash.AN USSR no.11:3-12 '64. (MIRA 17:10)

GONTKEVICH, V.S.; KOLODYAZHNYI, A.V.

Natural vibrations of annular plates. Trudy Lab.gidr.mash.AN USSR  
no.11:13-19 '64. (MIRA 17:10)

EWI(d)/EWI(m)/EWP(w)/EWA(d)/EWP(v)/ESP(k)/EnA(h) Pf-4/Peb  
 ACCESSION NR AM 5002710 EM BOOK EXPLOITATION S/

Gontkevich, Vladimir Sevast'yanovich

Natural vibrations of shells in a fluid medium / Sobatvennyye kolebaniya obolochek  
 (Prilozheniye), Kiev, Naukova dumka, 1964, 101 p. illus., biblio. (At head of  
 ... Akademiya nauk Ukrainskoy SSR. Khar'kovskiy filial instituta  
 mekhaniki) 2,400 copies printed.

TOPIC TAGS: shell vibration, shell theory, liquid medium

PURPOSE AND COVERAGE: This booklet examines the natural vibrations of shells  
 in a liquid. It cites the theory of phenomenon and presents methods of calculating  
 the frequencies of the vibrations of shells of various shape in finite and  
 infinite incompressible and incompressible liquids at various boundary conditions.  
 To facilitate the calculations, the booklet includes tables and graphs.  
 Theoretical results were checked experimentally in several models of reservoirs  
 and pipes of various shapes whose study is of practical interest. The booklet  
 is intended for researchers, engineers, and technicians working in the area of  
 hydroelasticity.

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SUBMITTED: 15Jul64

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OTHER: 017

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Gontkevich, Vladimir Savynst'yanovich

Natural vibrations of plates and shells; a handbook (Sobstvennyye kolebaniya plat-  
tinok i obolochek) Kiev, "Naukova dumka", 1964. 287 p. illus., biblio.,  
tables. 8000 copies printed. Editor: A. P. Filippova, Corresponding member of  
the Academy of Sciences of the Ukrainian SSR; Editor of the publishing house:  
R. L. Imas; Technical editor: M. P. Rakhlina; Proofreader: V. S. Dvorkina

TOPIC TAGS: natural vibration, plate vibration, shell vibration, vibration  
frequency

PURPOSE AND COVERAGE: This handbook was intended for engineers, designers, and  
scientific personnel in the field of machine design and buildings as well as for  
students in corresponding specializations. The natural vibrations of plates and  
shells are analyzed. Numerical data, presented as formulas, tabulations, and  
diagrams, permit calculating, fairly simply, the natural vibrations of thin shells  
and plates. Information is presented briefly concerning methods of calculating  
frequencies and modes of the natural vibrations of plates and shells. The book  
was prepared by V. S. Gontkevich and his colleagues in the "Dynamics and Strength

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of Machines<sup>14</sup> section of the Laboratory of Hydraulic Machinery of the Ukrainian Academy of Sciences.

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SUB CODE: ME

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ER REF SOV: 124

OTHER: 234

DATE REC: 01Oct64

CC

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GONTKEVICH, V.S., kand. tekhn. nauk (Khai'kov)

Natural vibrations of spherical shells. Issl. po teor. sooruzh.  
no.13:77-83 '64. (MIRA 18:2)

GONTKEVICH, V.S. (Khar'kov); OSTROVSKAYA, L.S. (Khar'kov)

Plane vibrations of thick cylindrical shells. Prikl. mekh.  
1 no.3:128-130 '65. (MIRA 18:7)

1. Khar'kovskiy filial Instituta mekhaniki AN UkrSSR.

GONTSEVICH, V.S. (Khar'kov)

Natural vibrations of elliptical plates and membranes. Prikl.  
mekh. 1 no.9:115-118 '65. (MIRA 18:10)

1. Khar'kovskiy filial Instituta mekhaniki AN UkrSSR.

L 45961-66 EWP(m)/ENT(1)

ACC NR: AT6025828 (N) SOURCE CODE: UR/3207/65/000/001/0008/0014

AUTHOR: Gontkevich, V. S.; Kolodyazhnyy, A. V. 40 3+1

ORG: Institute of Mechanics, AN UkrSSR, Khar'kov (Institut mekhaniki AN UkrSSR)

TITLE: Investigation of Strouhal numbers for solids of various shape in a plane flow

SOURCE: Gidroaeromekhanika (Hydroaeromechanics), no. 1, Kharkov, Izd-vo Khar'kovskogo univ., 1965, 8-14

TOPIC TAGS: plane flow, flow analysis, dimension analysis

ABSTRACT: The Strouhal numbers of obstacles are experimentally determined at the Khar'kov Department of the Institute of Mechanics AN UkrSSR. A small shock tube was used with a cross sectional working area of 48 cm<sup>2</sup>. The working chamber was a channel 75 mm high with parallel walls separated by a distance of 60 mm. Provision was made for continuous variation of velocity from 1 to 16 m/sec. The experimental specimens were cylinders of various profile, plates with various ratios of thickness to length and symmetric profiles. All specimens were approximately 75 mm long. The specimens were held in the working chamber by elastic leaf springs. The natural frequencies of the system were changed by using springs of various rigidity. The rigidity of the system could be varied by adjustment of tension screws. Strain gauges were fastened

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to the leaf springs and the amplified electrical oscillations were recorded on an MPO-2 loop oscillograph. Oscillation frequency was also determined on a cathode oscillograph from Lissajou figures using a ZG-10 audio frequency oscillator. The Strouhal number for the obstacle was calculated from experimental data on the vortex separation frequency, rate of undisturbed flow and width of the obstacle. Experimental data on the Strouhal number as a function of the Reynolds number for solids with good flow characteristics (circular, oval and truncated cylinders) show that the increased hydraulic resistance due to a given distortion in shape causes a considerable reduction in the Strouhal number for the obstacle. Similar experimental data for plates show that a reduction in the angle of attack from 90 to 0° increases the Strouhal number from 0.14 to 0.25-0.3. Orig. art. has: 7 figures, 1 table, 2 formulas.

SUB CODE: 20/ SUBM DATE: None/ ORIG REF: 003/ OTH REF: 008

Card 2/2 hs

ACC NR: AT6034486

SOURCE CODE: UR/0000/66/000/000/0098/0105

AUTHOR: Gontkevich, V. S., (Khar'kov); Ponomarenko, V.V. (Khar'kov)

ORG: none

TITLE: Free oscillations of cylindrical shells in a hypersonic gas flow

SOURCE: Khar'kov. Politehnicheskii institut. Dinamika i prochnost' mashin (Dynamics and strength of machines), no.3, Kharkov, Izd-vo Khar'kovskogo univ., 1966, 98-105

TOPIC TAGS: cylindric<sup>structure</sup> shell, hypersonic<sup>flow,</sup> gas flow, free oscillations, shell flutter, aircraft skin, rocket skin, *shell vibration, computer calculation, aircraft fuselage*

ABSTRACT: An analysis is presented of axisymmetric and nonaxisymmetric flutter of cylindrical shells in a hypersonic gas flow. The thin-shell and piston theories were used in the analysis. Numerical calculation were performed on a "Ural-2" electronic computer for clamped; freely-supported, and cantilever shells. This investigation was prompted by the failure of aircraft and rocket skin during flights at supersonic speeds. Orig. art. has: 3 figures, 3 tables, and 16 formulas. [WA-76, 88]

SUB CODE: 20/ SUBM DATE: 01Jun66/ ORIG REF: 008

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L 07563-67 EWT(d)/EWT(m)/EWP(w)/EWP(v)/EWP(k) 101(0) 111(0)  
 ACC NR: AT6029367 (N) SOURCE CODE: UR/0000/66/000/000/0104/0115

AUTHOR: Gontkevich, V. S. (Khar'kov)

ORG: none

TITLE: Calculation of damping of the vibrations of shells in a liquid

SOURCE: AN UkrSSR. Institut problem materialovedeniya. Rasseyaniye energii pri kolebaniyakh uprugikh sistem (Energy dissipation during vibrations of elastic systems). Kiev, Naukova dumka, 1966, 104-115

TOPIC TAGS: vibration analysis, vibration damping, tensor analysis, fluid viscosity

ABSTRACT: The properties of liquids encountered in practice are very different; however, application of the Stokes model for a viscous liquid satisfies the majority of practical requirements. Limiting the consideration to the case of a linear relationship between the tensor of the viscous stresses and the tensor of the deformation rates

$$T_{rs} = \gamma_{rs}^{mn} e_{mn}; \quad (1)$$

here  $\gamma_{rs}^{mn}$  is the fourth order viscosity tensor, with which, for an isothermal liquid where, for an isotropic liquid

$$\gamma_{rs}^{mn} = \lambda g^{mn} g_{rs} + \mu (\delta_r^m \delta_s^n + \delta_r^n \delta_s^m);$$

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ACC NR: AT6029367

$g^{mn}$ ,  $g^{rs}$  are the contravariant and covariant components of the metric tensor;  $\delta^{mn}$ ,  $\delta^{rs}$  are Kronecker symbols;  $\lambda$ ,  $\mu$  are the friction coefficients for elongation and shear, respectively. Theoretical calculations based on the above premises were verified by measurements made with cylindrical shells suspended in water. The experimental data agree satisfactorily with the theoretical values. Orig. art. has: 24 formulas and 2 figures.

SUB CODE: 20/ SUBM DATE: 22Feb66/ ORIG REF: 004/ OTH REF: 005

Card 2/2 not



GONTKOVSKAYA, V.T.

Classical methods of celestial mechanics in the light of modern  
computing technique. *Dokl. Akad. Nauk SSSR*, no. 17:16-20 '56.

(MLRA 10:1)

(Mechanics, Celestial) (Electronic calculating machines)

GONTKOVSKAYA, V. T. Cand Phys-Math Sci -- (diss) <sup>Use</sup> "The Application  
of Modern Computing Techniques to the Analytic Methods of  
Celestial Mechanics." Len, 1957. 6 pp 22 cm. (Academy of Sciences  
USSR, Main Astronomical Observatory), 100 copies (KL, 26-57,103~~800~~)

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GONTKOVSKAYA, V.T.

Using modern computation equipment in analytic methods  
of celestial mechanics. Biul.Inst.teor.astron. 6 no.9:  
592-629 '58. (MIRA 13:3)  
(Calculating machines) (Mechanics, Celestial)

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S/033/61/038/001/011/019  
E032/E314

AUTHORS: Gontkovskaya, V.T. and Chebotarev, G.A.

TITLE: Orbit of the Third Soviet Space Rocket (Lunik III)

PERIODICAL: Astronomicheskiy zhurnal, 1961, Vol. 38, No. 1,  
pp. 125 - 130

TEXT: The motion of Lunik III in the period October 15 to March 30, 1960, is investigated. The third Soviet space rocket was launched in the morning of October 4, 1959, in the direction of the Moon. On October 6 at 17<sup>h</sup> 21<sup>m</sup> Moscow time the rocket reached a distance of 6 200 km from the lunar surface. Vx

On October 11 at 0<sup>o</sup> 44<sup>m</sup> the rocket reached the apogee of its orbit (480 500 km from the Earth) after which it began to approach the Earth again. The passage of the rocket through the perigee should have taken place on October 18 at

19<sup>h</sup> 49<sup>m</sup> and the perigee distance should have been 47 490 km. However, for well-known reasons, the radio contact with the cosmic rocket was lost (Sedov - Ref. 1) and already during its first approach to the perigee the rocket could not be observed

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Orbit of the Third Soviet Space Rocket (Lunik III)

in spite of favourable conditions and the availability of an accurate ephemeride (Guntzel-Lingner, Ref. 2). The orbit of Lunik III is of particular interest from the standpoint of celestial mechanics. A particular feature of the orbit is that it has unusual elements ( $e = 0.98$ ,  $i = 85^\circ$ ) and the fact that its elements change rapidly as a result of approaches to the perturbing body (Moon). The information available at present (other than the TASS communiqué) consists of a short note by Sedov (Ref. 3) and the American calculations (Michaels, Wachman and Petty - Ref. 4). In the present paper the problem is formulated as follows:

- 1) the rocket moves in the gravitational field of the Earth, the Moon and the Sun;
- 2) all the bodies except the Earth are looked upon as mass points and the figure of the Earth is taken to be a biaxial ellipsoid;
- 3) both the equations of motion of the rocket and the equations for the Moon and the Sun are to be integrated, taking into

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account mutual perturbations. The equations of motion of the Moon and the Sun are of the form:

$$\begin{aligned}\frac{d^2\bar{r}_1}{dt^2} &= -\frac{m_0 + m_1}{r_1^3} \bar{r}_1 + m_2 \left( \frac{\bar{r}_2 - \bar{r}_1}{\Delta_{12}^3} - \frac{\bar{r}_2}{r_2^3} \right), \\ \frac{d^2\bar{r}_2}{dt^2} &= -\frac{m_0 + m_2}{r_2^3} \bar{r}_2 + m_1 \left( \frac{\bar{r}_1 - \bar{r}_2}{\Delta_{12}^3} - \frac{\bar{r}_1}{r_1^3} \right),\end{aligned}\quad (1)$$

while those of the rocket are:

$$\frac{d^2\bar{r}}{dt^2} = \bar{F} - \sum_{j=1,2} \frac{m_j}{r_j^3} [\bar{r} + \varphi_j(\bar{r} - \bar{r}_j)]. \quad (2)$$

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In the above equations  $\bar{r}_i$  and  $m_i$  are the radius vector and the mass of the  $i$ -th body multiplied by the gravitational constant; subscripts 0, 1, 2 refer to the Earth, the Moon and the Sun, respectively;  $\Delta_{ij}$  are the distances between the bodies;  $\bar{r}$  is the radius vector of the rocket; the equations are written down in the geocentric equatorial system of coordinates. The term  $F$  in Eq. (2) represents the attraction due to the Earth. The basic characteristics of the terrestrial ellipsoid are represented by the quantities  $\beta$ ,  $m$ ,  $n$ , which are related to the equatorial radius  $a$ , the compression  $\alpha$  and the angular velocity  $\omega$  of the ellipsoid by the formulae:

$$\beta = b^3 i^3, \quad b = a(1 - \alpha), \quad i^3 = (1 - \alpha)^{-3} - 1,$$

$$m_i = \frac{2}{3} \frac{(1 + i^3) \omega^3}{(3 + i^3) \arctg i - 3i},$$

$$n = m - m_0 \beta^{-1/2}.$$

(3)

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The components  $\vec{F}$  are given by:

$$\begin{aligned} F_x &= -(R - Tv) x e^{1/2}, \\ F_y &= -(R - Tv) y e^{1/2}, \\ F_z &= -(S - Tu) z e^{1/2}. \end{aligned} \quad (6)$$

where:

$$\begin{aligned} R &= m \sum_{k=0}^{\infty} (-1)^k \frac{3(k+1)}{2k+3} e^k, \\ S &= m \sum_{k=0}^{\infty} (-1)^k \frac{3}{2k+3} e^k, \quad T = \frac{n}{x^2 + y^2 + z^2 (1+e)^2} \quad (4) \\ e &= \frac{\beta}{v}, \end{aligned}$$

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and:

$$u = r^2 + \beta \frac{z^2}{v}, \quad v = u - \beta. \quad (5)$$

These equations can be transformed into the lunocentric  
coordinate system in which the equation of the rocket is given  
by:

$$\begin{aligned} \frac{d^2 \bar{p}}{dt^2} &= -\frac{m_1}{p^3} \bar{p} - \frac{m_0}{p_0^3} \bar{p}_0 + \Phi - \frac{m_2}{p_2^3} [\bar{p} + \psi_2 (\bar{p} - \bar{p}_2)], \\ \frac{d^2 \bar{p}}{dt^2} &= -\frac{m_1}{p^3} \bar{p} - \sum_{j=0,2} \frac{m_j}{p_j^3} [\bar{p} + \psi_j (\bar{p} - \bar{p}_j)]. \end{aligned} \quad (9)$$

In this equation:

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Orbit of the Third Soviet Space Rocket (Lunik III)

$$\bar{\rho} = \bar{r} - \bar{r}_1, \quad \bar{\rho}_0 = -\bar{r}_1, \quad \bar{\rho}_2 = \bar{r}_2 - \bar{r}_1.$$

The quantities of  $\bar{\Phi}$  and  $\bar{\psi}$  respectively represent  $\bar{F}$  and  $\bar{\varphi}$  in lunocentric coordinates. Numerical integration of these equations yielded the results given in Table 4, the key of which is as follows: 1 - date; 2 - M, deg; 3 -  $a(1 - e)$ , km; 4 - October; 5 - November; 6 - December; 7 - January; 8 - February; 9 - March.

Fig. 2 shows the variation in the eccentricity of the orbit, Fig. 3 shows the variation in the perigee distance and Fig. 4 shows the variation in the inclination of the orbit. It was found that the effect of the compression of the Earth on the motion of the rocket lay within the limits of accuracy of integration. There are 4 figures, 5 tables and 6 references: 4 Soviet and 2 non-Soviet. ✓

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Orbit of the Third Soviet Space Rocket (Lunik III)

ASSOCIATION: Institut teoreticheskoy astronomii Akademii  
nauk SSSR (Institute of Theoretical  
Astronomy of the Academy of Sciences, USSR)

SUBMITTED: October 7, 1960

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Table 4:

Таблица 4

Элементы орбиты третьей космической ракеты

Дата 1959-1960 гг.	M в град.	$\omega$ в град.	$\pi$ в град.	$\Omega$ в град.	i в град.	a в км	e	a(1-e) в км	a(1+e) в км
18.7 окт.	0.51	182.03	73.84	251.81	79.97	264 800	0.824	46 640	482 900
3.7 нояб.	0.40	182.65	74.44	251.79	80.99	270 200	0.839	43 510	497 000
20.0 нояб.	1.62	184.25	76.44	252.19	84.92	266 300	0.856	38 440	494 200
5.0 дек.	0.93	184.58	76.91	252.33	84.48	270 400	0.882	31 940	508 900
22.5 дек.	0.80	186.02	77.45	251.43	82.93	269 900	0.903	28 060	513 800
6.7 янв.	0.67	184.60	75.70	251.11	83.09	261 800	0.924	19 830	502 800
22.4 янв.	0.40	185.01	75.18	250.17	74.37	267 100	0.933	17 890	516 200
8.8 февр.	0.02	183.72	76.02	252.30	57.95	283 800	0.950	14 170	553 500
25.8 февр.	0.35	184.22	75.12	250.90	48.00	292 100	0.951	14 220	570 100
14.6 март	0.29	184.17	74.02	249.85	47.75	292 500	0.955	13 030	571 900
30.7 март	359.00	180.57	70.38	249.81	56.85	270 100	0.980	5 350	534 800

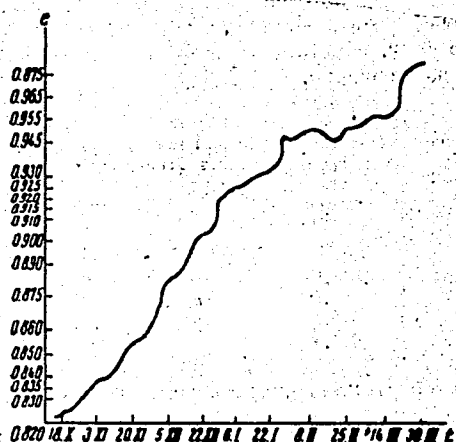
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Fig. 2:



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Fig. 3:

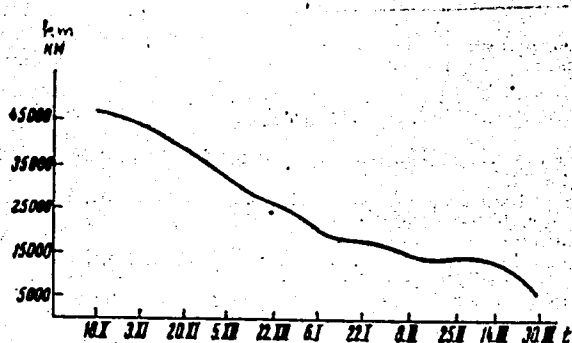


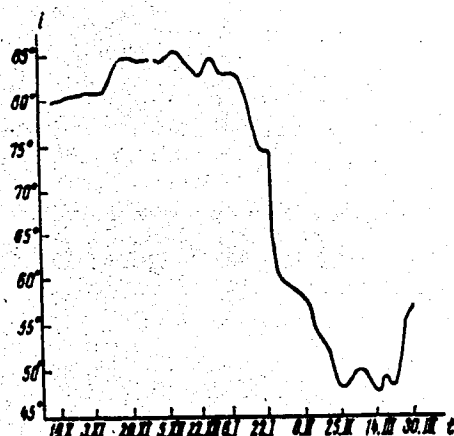
Рис. 3. Изменение перигейного расстояния третьей советской космической ракеты

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Orbit of the Third Soviet Space Rocket (Lunik III)

Fig. 4:



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Рис. 4. Изменение наклонения орбиты третьей советской космической ракеты.

42564

3.2200

S/816/61/000/024/002/003

AUTHORS: Makover, S. G., Gontkovskaya, V. T., Kochina, N. G., Sochilina, A. S., and Subbotina, N. S.

TITLE: Investigation of the motion of the second Soviet artificial earth satellite (Sputnik II or 1957  $\beta$ ).

SOURCE: Akademiya nauk SSSR. Astronomicheskiy sovet. Byulleten' stantsiy opticheskogo nablyudeniya iskusstvennykh sputnikov Zemli. no. 24. 1961, 11-16.

TEXT: This is a presentation of the results of calculations of the orbit elements of Sputnik II from November 1957 to March 1958, based on visual tracking data, as used in the short-range prediction of the ephemerides. The method employed is outlined in the paper by Makover, S. G., The orbit determination of artificial earth satellites. Byulleten' stantsiy ... no. 24, 1961, 3-11 (Abstract S/816/61/000/024/-001/003). Computations were performed on the BESM (BESM) electronic high-speed computer of the AS USSR Computing Center (A. A. Dorodnitsin, Director); all preparatory work was done at the State Astronomical Institute imeni Shternberg (D. Ya. Martynov, Director). The computation program comprised the following specific steps: (1) Computation of the instantaneous orbit elements for the time of a given observation; (2) computation of the rectangular satellite coordinates from

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S/816/61/000/024/002/003

the formulas of its elliptical motion; (3) computation of the local sidereal time and the rectangular coordinates of the observation station; (4) computation of the spherical equatorial coordinates of the satellite and comparison between calculated and observed coordinates; (5) computation of the coefficients of tentative equations; and (6) computation of the corresponding component coefficients for the normal equations. Computational stages (1) through (6) were performed consecutively for each observer, resulting in the ultimate coefficients of the normal equations. The following operations were then performed: (7) Determination of corrections to the elements as obtained from the solution of the system of normal equations, and determination of an improved system of elements; (8) determination of weight factors for each unknown. An entire cycle of orbit improvement from 100 observations required only one minute of machine time. Upon completion of all computations including stages (1) through (8), the entire computational cycle was repeated until convergence of the successive approximations was achieved (usually, 5 to 6 cycles). An additional computation was made of the so-called "variations," i.e., the changes of the right ascension and declination of the satellite due to an assumed 1-second error in the time determination by the observer; this variation was found to be useful in the analysis and reconciliation of differences between observational values and theory. Elimination of gross errors, e.g., incorrect time readings, mistaken identities of reference stars, etc., was achieved by eliminating any observation with a

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spherical-coordinate error of more than a given limit ( $15^\circ$  in the first improvement cycle, down to  $5^\circ$  in the last cycle). The observations used came primarily from the Soviet visual-satellite-observations tracking network and consisted of right-ascension and declination data referred to the equinox 1950.0; the nominal angular accuracy was assumed to be  $0^\circ.1$ , time accuracy  $0^s.1$ . However, even after elimination of gross errors, the actual mean-square accuracy of a single observation was  $\pm 2^\circ.0$ , possibly attributable primarily to bad time keeping. Initially, data were reported via the Astronomicheskii soviet (Astronomical Council), AS USSR, later directly by telegraph. Some foreign observations were used, but most arrived too late for inclusion. A few high-accuracy photographic observations made at Pulkovo, Moscow, and elsewhere were included. As a by-product, the differences between the observed and the computed coordinates of the satellite were used to grade the quality of the data provided by each station. Numerical results are presented in 1 table; there is 1 Soviet (only) reference.

ASSOCIATION: Institut teoreticheskoy astronomii AN SSSR (Institute of Theoretical Astronomy, AS USSR).

SUBMITTED: July 6, 1961.

Card 3/3

30823  
S/033/61/038/005/011/015  
E032/E414

3,2200 (1080, 1121, 1132)

AUTHORS: Gontkovskaya, V.T., Chebotarev, G.A.

TITLE: Lunar and solar perturbations in the motion of the third Soviet space rocket

PERIODICAL: Astronomicheskii zhurnal, v.38, no.5, 1961, 954-960

TEXT: The authors report the results of a numerical integration giving separately the effects of lunar and solar perturbations in the motion of the third Soviet space rocket. The oblateness of the Earth was found to have a negligible effect. The differential equation for the motion of the rocket in the gravitational field of the Earth and the Moon, neglecting the solar perturbations, is taken to be of the form

$$\frac{d^2 \mathbf{r}}{dt^2} = -\frac{m_0}{r^3} \mathbf{r} - \frac{m_1}{r_1^3} [\mathbf{r} + \varphi_1 (\mathbf{r} - \mathbf{r}_1)], \quad (1)$$

where  $\mathbf{r}$  is the radius vector of the rocket,  $\mathbf{r}_1$  is the radius vector of the Moon,  $m_0$  is the mass of the Earth and  $m_1$  is the mass of the Moon. The right-hand side is then expanded so that

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E032/E414

Lunar and solar perturbations ...

$$\varphi_i = \varphi(q_i) \begin{cases} \sum_{k=1}^{\infty} \frac{(2k+1)!!}{k!} q_i^k, & \text{when} \\ & \text{если } |q_i| < 2^{-3}, \\ (1-2q_i)^{-1/2} - 1, & \text{when} \\ & \text{если } |q_i| \geq 2^{-3}, \end{cases} \quad (2)$$

$$q_i = \frac{1}{r_i^3} \left( xx_i + yy_i + zz_i - \frac{1}{2} r^2 \right).$$

Finally, the equations describing the geocentric motion of the Moon and the Sun including mutual perturbations are taken to be of the form

$$\frac{d^2 r_1}{dt^2} = -\frac{m_0 + m_1}{r_1^3} r_1 + m_2 \left( \frac{r_2 - r_1}{\Delta_{12}^3} - \frac{r_1}{r_2^3} \right), \quad (3)$$

$$\frac{d^2 r_2}{dt^2} = -\frac{m_0 + m_2}{r_2^3} r_2 + m_1 \left( \frac{r_1 - r_2}{\Delta_{21}^3} - \frac{r_2}{r_1^3} \right), \quad (4)$$

where  $r_2$  and  $m_2$  are the radius vector and the mass of the Sun  
Card 2/3

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S/033/61/038/005/011/015  
E032/E414

Lunar and solar perturbations ...

$\Delta_{12} = \Delta_{21}$  is the distance between the Moon and the Sun. The initial instant of time was taken to be October 15, 1959, 15<sup>h</sup>00<sup>m</sup>. The integration of the equations was carried out by the Runge-Kutta method. The results are illustrated by Fig.1 to 4. There are 4 figures, 6 tables and 6 references: 3 Soviet-bloc and 3 non-Soviet-bloc. The references to English language publications read as follows:

Ref.1: Y.Kozai, Smithsonian Institution Astrophysical Observatory, Research in Space Science, Special Report, No.22, March 20, 1959;  
Ref.2: E.Upton, A.Bailie, P.Musen, Science, v.130, no.3390, 1710-1711, 18 Dec. 1959;  
Ref.3: M.Moe, Astron. Roy. Soc. J., v.30, no.5, 1960.

ASSOCIATION: Institut teoreticheskoy astronomii Akademii nauk SSSR  
(Institute of Theoretical Astronomy AS USSR)

SUBMITTED: January 20, 1961

Card 3/3

42985

S/035/62/000/011/009/079  
A001/A101

24.4100

AUTHOR:

Gontkovskaya, V. T.

TITLE:

On orbit determination by means of solution of the system of  
integral equations

PERIODICAL:

Referativnyy zhurnal, Astronomiya i Geodeziya, no. 11, 1962, 10,  
abstract 11A83 ("Byull. In-ta teor. astron. AN SSSR", 1962, v. 8,  
no. 4, 283 - 298, English summary)

TEXT:

The problem of determining an unperturbed Keplerian orbit from two  
heliocentric positions is considered as a boundary problem of mathematical phys-  
ics. Its solution is reduced to the solution of a non-linear integral equation.  
The latter is solved by the successive approximation method and by the Newton  
method. The rate of convergence of successive approximations is estimated. Con-  
ditions which ensure convergence are derived. The error of an n-th approximation  
is estimated.

Yu. B.

[Abstracter's note: Complete translation]

Card 1/1

44559  
S/020/63/148/001/031/032  
B101/B186

11.7.00

AUTHORS: Merzhanov, A. G., Abramov, V. G., Gontkovskaya, V. T.

TITLE: Rules for the transition from self-ignition to ignition

PERIODICAL: Akademiya nauk SSSR. Doklady, v. 148, no. 1, 1963, 156-159

TEXT: A theoretical investigation of an unsteady temperature field within a cylindrical system, made to determine the boundaries of self-ignition and the transition to ignition, is reported. It is assumed that the initial temperature of the system is lower than that of the ambient medium, that the temperature at the system surface is constant, and that the reaction is of zeroth order. The starting point is the equation:

$$\partial\theta/\partial\tau = \exp[\theta/(1 + \beta\theta)] + (1/\delta)(\partial^2\theta/\partial\xi^2 + \partial\theta/\partial\xi); 0 \leq \xi \leq 1; 0 \leq \tau < \infty.$$

The initial and the boundary conditions are:  $\theta(\xi, 0) = -\theta_0$ ;  $\theta(1, \tau) = 0$ ;

$\partial\theta/\partial\xi|_{0, \tau} = 0$ , where  $\theta = (E/RT_0^2)(T - T_0)$ ;  $\xi = x/r$ ;  $\tau =$

$(Q/c_0)(E/RT_0^2)k_0 \exp(-E/RT_0) \cdot t$ ;  $\delta = (QE/\lambda RT_0^2)r^2 k_0 \exp(-E/RT_0)$ ;  $\beta = RT_0/E$ ;

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Rules for the transition from ...

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$\theta_0 = (E/RT_0^2)(T_0 - T_{in})$ ;  $x$  = radial coordinate (cm);  $t$  = time (sec);  
 $T(x,t)$  = temperature ( $^{\circ}\text{K}$ );  $T_0$  = temperature of the medium ( $^{\circ}\text{K}$ );  $T_{in}$  =  
 initial temperature of the system ( $^{\circ}\text{K}$ );  $r$  = radius of the cylinder (cm);  
 $E$  = energy of activation (cal/mole);  $Q$  = heat effect of the reaction  
 (cal/cm<sup>3</sup>);  $\lambda$  = coefficient of thermal conductivity (cal/cm·sec·deg);  
 $c$  = specific heat (cal/g·deg);  $\rho$  = density (g/cm<sup>3</sup>); the dimension of the  
 factor  $k_0$  is sec<sup>-1</sup>.  $\delta$  is the criterion by Frank-Kamenetskiy (ZhFKh, 13,  
 738 (1939)) which is the most important of the dimensionless parameters  
 ( $\delta$ ,  $\theta_0$ , and  $\beta$ ) used for determining the position of the self-ignition  
 limits;  $\theta_0$  characterizes the thermal head; the parameter  $\beta$  only slightly  
 effects the system. The differential equation was split up into a system  
 of finite-difference equations. The temperature distribution as a  
 function of the time and the parameters was calculated by computer. In  
 all calculations,  $\beta = 0.03$  was assumed, the other parameters were varied:  
 $0 < \delta < 1000$ ;  $0 < \theta_0 < 16$ . Results: (1) For  $\delta \sim \delta_{crit}$ , all points of the

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system are simultaneously heated to the temperature of the medium, the temperature maximum during the entire process of heating is in the center (on the cylinder axis), hence inflammation is initiated. (2) Noncontemporary heating sets in with rising  $\delta$ , a temperature maximum develops near the surface and migrates to the center. If  $\delta$  is not very large, the thermal wave reaches the center and inflammation sets in as in the case of (1). If  $\delta$  is large, inflammation occurs before the thermal wave has reached the center. If  $\delta$  is very large, inflammation occurs near the surface and the temperature of the center remains unchanged. (3) With increasing heating, the abscissa of the maximum approaches a value  $\xi_{\text{expl}}$ . Self-ignition sets in at  $\xi_{\text{expl}} = 0$ , but only in the narrow range  $\delta_{\text{crit}} < \delta < \delta'_{\text{crit}}$ , where  $\delta_{\text{crit}} = 2.07$  and  $\delta'_{\text{crit}} = 12.0 - 12.5$  according to J.R. Parks (J.Chem.Phys., 34,46 (1961)). For  $\delta > \delta'_{\text{crit}}$ ,  $\xi_{\text{expl}}$  with increasing  $\delta$ , asymptotically approaches the curve  $\xi_{\text{expl}} = 1 - \text{const}/\sqrt{\delta}$ , which describes ignition. (4) In the range  $0 < \theta_0 < 16$ ,  $0 < \delta < 12$ , the equations  $\tau_h = 0.48\theta_0^{0.22}\delta^{0.85} - 0.6/\theta_0$ ;

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B101/B186

$\tau_{ind} = 1 + 1/(\delta - 2)^{0.92}$ , (at  $\theta_0 = 0$ ), hold for the heating time  $\tau_h$  and the induction time  $\tau_{ind}$ . Presently this scheme is used to calculate autocatalytic reactions and to elucidate the effect of external heat exchange on the transition from self-ignition to ignition. There are 4 figures and 1 table. The most important English-language reference is: J. Zinn, C.L. Mader, J.Appl.Phys., 31,323 (1960).

ASSOCIATION: Institut khimicheskoy fiziki Akademii nauk SSSR (Institute of Chemical Physics of the Academy of Sciences USSR)

PRESENTED: July 12, 1962, by Ya.B. Zel'dovich, Academician

SUBMITTED: July 2, 1962

Card 4/4

45159

S/020/63/148/002/035/037  
B124/B186

11.8300

AUTHORS: Merzhanov, A. G., Barzykin, V. V., Gontkovskaya, V. T.

TITLE: Problem of focal heat explosion

PERIODICAL: Akademiya nauk SSSR. Doklady, v. 148, no. 2, 1963, 380-383

TEXT: The local heating focus causing a heat explosion is given by a  $\Pi$ -shaped temperature profile at the initial instant of time in a spherical system of coordinates. The dimensions of the focus are assumed to be much smaller than the main mass of the substance. The initial differential

equation  $\partial\theta/\partial\tau = e^{\theta/(1+\beta\theta)} + (1/\delta)[(\partial^2\theta/\partial\xi^2) + (2/\xi)(\partial\theta/\partial\xi)]$ ,  $0 \leq \xi < \infty$ ,  $\tau \geq 0$  with the initial and boundary conditions  $\tau = 0$ ,  $\theta = 0$  for  $\xi \leq 1$ ;  $\theta = -\theta_0$  for  $\xi > 1$ ;  $\theta = -\theta_0$  for  $\xi = \infty$  was solved with an electronic computer. The temperature distribution was determined as a function of time and of the parameters of the system  $\theta = \theta(\xi, \tau, \delta, \theta_0)$ . Here  $\theta = (E/RT_0^2)(T-T_0)$ ;  $\xi = x/r$ ;

$\tau = (QEk_0/cqRT_0^2)e^{-E/RT_0t}$ ;  $\delta = (QEr^2k_0/\lambda RT_0^2)e^{-E/RT_0}$ ;  $\beta = RT_0/E$  and  $\theta_0 = (E/RT_0^2)(T_0-T_1)$ ,  $x$  is the radial coordinate,  $t$  is the time,  $T(x,t)$  is Card 1/3

Problem of focal heat explosion

S/020/63/148/002/035/037  
B124/B186

the temperature,  $T_0$  denotes the initial temperature of the focus,  $T_1$  is the temperature of the mass of the substance at a certain distance from the focus,  $r$  is the initial radius of the focus,  $Q$  is the heat effect of the reaction,  $k_0$  is the factor of the exponential function,  $E$  is the activation energy,  $\lambda$  is the heat conduction coefficient,  $c$  is the thermal capacity and  $\rho$  is the density.  $\beta$  was taken to be 0.03; furthermore,  $4 < \theta_0 < 25$ . The approximation formulas  $\delta_{crit} \approx 12.1(\ln \theta_0)^{0.6}$ ,  $r_{crit} \approx 3.48 T_0 \sqrt{(\lambda R / k_0 Q E) e^{E/2RT_0} \ln[(E/RT_0^2) T_0 - T_1]}^{0.3}$  and  $\delta_{crit} \approx 20$ ;  $\tau_{crit} \approx 2$ ;  $\theta_{max.crit} \approx 4$  were obtained. It has been found, for example, that for  $\theta_0 = 10.35$  and  $\delta/\delta_{crit} = 1.4$   $\tau/\tau_{adiab} = 1.03$  where  $\tau_{crit}/\tau_{adiab} = 1.63$ .

The properties of the focus depend only slightly on  $\beta$ . The characteristics of the process are hardly influenced by the burn-out. The focal explosion is not influenced by the reactivity of the neighborhood or the fulfillment of the boundary conditions on the surface of the focus. The presence of a neighborhood capable of reaction is, however, of considerable importance in the second stage of the reaction, i.e. when a self-propagating process is

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Problem of focal heat explosion

S/020/63/148/002/035/037  
B124/E186

excited in the main mass of the substance. On the basis of calculations it could be concluded that during the induction period the dimensions of the focus reduce to temperature levels that correspond to the reaction maximum. In first approximation  $(dx/dt)_{\text{initial}} = b/\delta$  is valid for the initial propagation rate of the process near the boundary where  $b$  depends only slightly on  $Q_0$  and  $\delta$  so that  $(dx/dt)_{\text{initial}} = (2 \text{ to } 3)10^3 a/d$  ( $a$  denotes the temperature diffusivity and  $d$  the initial diameter of the focus). The dependence of the initial propagation rate on the diameter is obviously connected with the non-steady excitation of the process. There are 4 figures and 3 tables. ✓

ASSOCIATION: Institut khimicheskoy fiziki Akademii nauk SSSR (Institute of Chemical Physics of the Academy of Sciences USSR)

PRESENTED: July 12, 1962, by N. N. Semenov, Academician

SUBMITTED: July 12, 1962

Card 3/3

ACCESSION NR: AP4041201

S/0207/64/000/003/0118/0125

AUTHORS: Barzykin, V. V. (Moscow); Gontkovskaya, V. T. (Moscow); Marshanov, A. G. (Moscow); Khudyayev, S. I. (Moscow)

TITLE: Nonstationary theory of thermal explosion

SOURCE: Zhurnal prikladnoy mekhaniki i tekhnicheskoy fiziki, no. 3, 1964, 118-125

TOPIC TAGS: thermal explosion, heat transfer, Newtonian heat exchange, thermophysics, approximate formula

ABSTRACT: The authors use an electronic computer to analyze and solve a system of partial differential equations for thermal explosion for a reaction of zeroth and first order with conductive heat transmission in the reaction zone and Newtonian heat exchange on the boundary. They analyze

$$\text{and } \frac{\partial \eta}{\partial \tau} = \tau \varphi(\eta) \exp \frac{\theta}{1+\beta \theta} \quad \frac{\partial \theta}{\partial \tau} = \varphi(\eta) \exp \frac{\theta}{1+\beta \theta} + \frac{1}{\delta} \left( \frac{\partial \theta}{\partial \xi} + \frac{\eta}{\xi} \frac{\partial \theta}{\partial \xi} \right) \quad (1)$$

$$\theta = \frac{E}{RT_0} (T - T_0), \quad \tau = \frac{QE k_0}{\varphi RT_0^2} \exp \left( -\frac{E}{RT_0} \right), \quad \xi = \frac{z}{r},$$

$$\delta = \frac{QE r^2 k_0}{\lambda RT_0^2} \exp \left( -\frac{E}{RT_0} \right), \quad \gamma = \frac{\varphi RT_0^2}{QE}, \quad \beta = \frac{RT_0}{E} \quad (2)$$

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ACCESSION NR: AP4041201

where  $\Theta$  is heating,  $\tau$  is time,  $\xi$  is a coordinate,  $\delta$  is the criterion of Grank-Kamenetskiy,  $n = 0, 1$  and  $2$  respectively for plane-parallel, cylindrical, and spherical containers,  $\eta$  is the depth of transformation. The dimensionless variables are:  $T(x, t)$  - temperature in the reaction region,  $T_0$  - temperature of the ambient medium,  $Q$  - thermal effect of the reaction,  $k_0$  - pre-exponent,  $E$  - activation energy,  $\lambda$  - coefficient of heat conductivity,  $c$  - specific thermal capacity,  $\rho$  - density,  $R$  - universal gas constant,  $r$  - radius of the container (for plane-parallel - half of the thickness). The authors refine the determination of the basic characteristics of thermal explosion. They present the results in the form of approximate formulas relating the characteristics of thermal explosion with all the parameters of the problem in a wide range of variation. A criterion is given for applicability of the equation averaged over the region for computing the period of induction in the case of conductive heat transmission in the reaction region, and a method for averaging the system of equations for thermal explosion is proposed. Orig. art. has: 5 figures, 6 tables, and 9 formulas.

ASSOCIATION: none

SUBMITTED: 23Jan64

SUB CODE: TD  
Card 2/2

NO REF SOV: 008

ENCL: 00

OTHER: 005

GONTKOVSKAYA, V. T.

"Numerical methods of solution of some problems of heat explosion and burning using electronic digital computers."

report submitted for 2nd All-Union Conf on Heat & Mass Transfer, Minsk, 4-12 May 1964.

Inst of Chemical Physics, AS USSR.

L 15870-66 EWT(1)/EWT(m)/EPF(n)-2/FCC/T/ETC(m)-6/EWP(n) WW/JW/JWD/WE  
ACC NR: AP6004428 SOURCE CODE: UR/0414/65/000/003/0036/0040

AUTHOR: Strunina, A. G. (Moscow); Gontkovskaya, V. T. (Moscow); Merzhanov, A. G. (Moscow)

ORG: none

21,44,55  
TITLE: Dynamic conditions of thermal explosion. III. Temperature field during heating and problems of the transition from spontaneous combustion to ignition 63 11<sup>3</sup> 44,55

SOURCE: Fizika gorenija i vzryva, no. 3, 1965, 36-40

TOPIC TAGS: chemical explosion, combustion kinetics, temperature distribution

ABSTRACT: Equations for thermal explosion during heating are numerically solved with regard to temperature distribution. The paper is a continuation of previous studies (A. G. Merzhanov, A. G. Strunina, Scientific and Technical Problems of Combustion and Explosion, 1965, 1; A. G. Merzhanov, A. G. Strunina, Z. B. Mayofis, Scientific and Technical Problems of Combustion and Explosion, 1965, 2) and the notation is the same as that used in these articles. The problem was solved on a computer. Analysis of the numerical solution shows that ignition under dynamic heating conditions is completely analogous to the process under static conditions. The

Card 1/3

UDC: 536.46+536.48 2



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ACC NR: AP6004428

basic parameter in defining the exchange conditions is the rate of heating  $\omega$ . Curves are given showing nonstationary temperature profiles for a monomolecular reaction at a Biot number of infinity and various values of  $\omega$ . Four regions are distinguished with respect to heating rate: 1.  $\omega < \omega_*$  -- ignition does not take place; 2.  $\omega_* < \omega < \omega'_*$  -- region of spontaneous combustion. For the case of heating close to the surface, a maximum is developed in the heating cycle which then moves to the center of the system (ignition starts at the center); 3.  $\omega > \omega'_*$  -- the transition region for ignition conditions. The heating maximum does not reach the center, and ignition starts some distance away. As the heating rate is increased, the coordinate for generation of combustion moves toward the surface; 4.  $\omega \gg \omega'_*$  -- the limiting region of ignition. A table is given showing the upper and lower critical heating rates for various Biot numbers. The data show that the spontaneous combustion region is considerably wider under dynamic conditions than for static processes. This is due to the fact that conditions for generation of a heating maximum are less favorable in the dynamic process because of the temperature increase on the surface of the system. The region of spontaneous combustion under dynamic conditions increases in latitude with a reduction in the Biot number. These data are compared with solutions disregarding temperature distribution. Curves are given based on both systems of equations for the temperature of onset of combustion as a function of heating

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ACC NR: AP6004428

rate. The curves show a divergence of only about  $2^{\circ}\text{C}$  throughout the entire region of spontaneous combustion. Thus temperature distribution may be disregarded in this region. Orig. art. has: 4 figures, 1 table, 4 formulas.

SUB CODE: 21/ SUBM DATE: 22Jan65/ ORIG REF: 004/ OTH REF: 000

LC  
Card 3/3

L 23047-66 EWT(1)/EWT(m)/EWP(f)/EPF(n)-2/T/ETC(m)-6 WH/JW/WE

VCC NR: AP6012524

SOURCE CODE: UR/0062/66/000/003/0429/0437

AUTHOR: Abramov, V. G.; Gontkovskaya, V. T.; Merzhanov, A. G.

ORG: Institute of Chemical Physics, Academy of Sciences SSSR (Institut khimicheskoy fiziki Akademii nauk SSSR)

TITLE: The theory of thermal ignition. Communication 1. The rules of transition from autoignition to ignition

SOURCE: AN SSSR. Izvestiya. Seriya khimicheskaya, no. 3, 1966, 429-437

TOPIC TAGS: combustion, ignition, autoignition, propulsion

ABSTRACT: This paper is the second in a series attempting to evaluate analytically ignition and autoignition as limiting conditions of one and the same process. By analyzing the nonsteady state temperature field of a reacting system whose temperature is lower than that of the surrounding medium, the authors investigated the occurrence of ignition in a broad range of parameters. The upper limits of autoignition were determined. The possibility was demonstrated of dividing the total ignition delay time into an induction period and a period of heating of the entire region of autoignition. The influence of the geometry of the system on the ignition parameters is evaluated in detail. The transition from autoignition to ignition was studied for an infinite-cylinder model. Orig. art. has: 3 tables and 7 figures. [VS]

combustion 53

SUB CODE: 21/ SUBM DATE: 31Oct63/ ORIG REF: 004/ OTH REF: 003/ ATD PRESS:

Card 1/1 FW

UDC: 536.46

4234

L 29921-66 EWT(1)/EWT(m)/ETC(f)/T WW/JW/JWD/WE

ACC NR: AP6017874

SOURCE CODE: UR/0062/66/000/005/0823/0827

AUTHOR: Abramov, V. G.; Gontkovskaya, V. T.; Merzhanov, A. G.ORG: Institute of Chemical Physics, Academy of Sciences SSSR (Institut khimicheskoy fiziki Akademii nauk SSSR)TITLE: The theory of thermal ignition<sup>11</sup>. Communication 2. The effect of external heat transfer on ignition characteristics

SOURCE: AN SSSR. Izvestiya. Seriya khimicheskaya, no. 5, 1966, 823-827

TOPIC TAGS: ignition, combustion, thermal ignition

ABSTRACT: An analysis has been made of the effect of heat transfer through the walls of a vessel on the ignition characteristics of a gas reacting mixture. The reaction was assumed to be of zero order. The calculations were made for Biot numbers in the range from 0.01 to 100. Plots of the non-steady state temperature profiles showed that with decreasing Bi, the region of self-ignition is considerably expanded, but at very low Bi ignition is impossible. The induction period near the upper self-ignition limit approaches, with decreasing Bi, a value which corresponds to an adiabatic regime. Formulas were obtained for calculating the heating periods and also the minimum ignition delay time. Orig. art. has: 6 figures. [PV]

SUB CODE: 21/ SUBM DATE: 13Jan64/ ORIG REF: 002/ OTH REF: 001/ ATD PRESS 5011

Card 1/1 CC

UDC: 541.126+543.873

STANCIU, B.; GONTOIU, Ion, sef de brigada; MIRICA, Ion, maistru;  
ANTONOV, Haralambie, ing.

Pride in being a front-ranker. Constr Buc 16 no. 740:3  
14 March 1964.

GONTOVAYA, N. A.; VAYNBERG, Ye.G.; KATS, Ye.I.

Case of Breslau salmonellosis caused by the consumption of  
lightly-salted brynza. Zhur. mikrobiol., epid. i imm. 41  
no. 2:150 F '64. (MIRA 17:9)

1. Respublikanskaya sanitarno-epidemiologicheskaya stantsiya  
Moldavskoy SSR.

POLISSKIY, N.Ya., inzhener; ~~GONTOVENKO, N.P.~~, inzhener; TAMARIN, L.I.,  
inzhener; CHIRKOV, Ye.V., inzhener; AVRAMENKO, P.S., inzhener.

Mechanization and automation of the varnish insulation section  
in the line for continuous manufacturing of armatures for direct  
current machines. Vest.elektroprom. 27 no.11:5-14 M '56.  
(MLRA 9:12)

1. Kharkovskiy Elektromekhanicheskiy zavod.  
(Armatures) (Electric insulators and insulation)  
(Automatic control)

GONTOVENKO, N.P.

AUTHORS: Polisskiy, N.Ya., Gontovenko, N.P. and Tamarin, L.I.,  
(Engineers). 110-7-22/30

TITLE: Modernisation of the control of hydraulic presses for  
plastics. (Modernizatsiya upravleniya gidropressami dlya  
plastmass).

PERIODICAL: "Vestnik Elektromyshlennosti" (Journal of the  
Electrical Industry), Vol.28, No.7, 1957, pp.66-69 (USSR).

ABSTRACT: One method of increasing the output of hydraulic presses  
is to replace manual by semi-automatic control. The  
hydraulic circuit of a 100 ton press provided with semi-  
automatic control is illustrated in Fig.1 which also  
gives a table of valve positions at different times in  
the operating cycle. Fig.2 illustrates the construction  
of a valve the operation of which is based on that of the  
so-called floating valve. The principles of operation of  
the valve are described. The operation of the automatic  
circuit is also described. A special procedure is adopted  
to slow down the press just before it closes on the tool.  
The electrical circuit of the equipment is given in Fig.3.  
With semi-automatic control of the press only two push-  
buttons are required. All the remaining switching is  
carried out automatically. The circuit provides reliable

Card  
1/2



Modernisation of the control of hydraulic presses for plastics. (Cont.)

110-7-22/30

interlocking. The use of semi-automatic control in the manufacture of hot pressed parts increased the output by some 5% and of cold pressed parts by 20-30%. When semi-automatic equipment is installed the pay-off time is very short. There are less packings in the new design of valves and therefore leakage of high pressure fluid is reduced. This cuts down electric power consumption.

There are 3 figures and 3 tables. There are no references.

ASSOCIATION: Khar'kov Electrical and Mechanical Works. (KEME).

AVAILABLE:

Card 2/2

GONTOVENKO, N.P.; ROZENBERG, Yu.G.; ZAMALIN, P.S.; TSUKERMAN, S.I.;  
~~GONTARENKO, I.F.~~; SYTNYANSKIY, V.D.; MARKMAN, L.L.

Smelting of pig iron in a coke gas cupola furnace. Prom. energ.  
15 no.8:14-16 Ag '60. (MIRA 15:1)

(Cupola furnaces)  
(Coke-oven gas)

S/169/62/000/009/033/120  
D228/D307

AUTHOR: Gontoviy, I. Z.

TITLE: Some problems in the interpretation of observed reflected wave hodographs

PERIODICAL: Referativnyy zhurnal, Geofizika, no. 9, 1962, 30, abstract 9A194 (Pratsi. In-t geol. korisn. kopalin AN URSR, 3, 1961, 149-151 (Ukr.))

TEXT: Two points in the interpretation of reflected wave hodographs are considered in connection with the development of the method of mass spatial sounding in the Ciscarpathian Trough. 1) The determination of the value of  $t_0$  of the explosion point from the surface hodograph that does not intersect the time axis. Knowing the arrival time at the sounding's central point and the gradient of the surface hodograph's function, the value of  $t_0$  can be found from the precalculated pallet of the theoretical hodographs. 2) The construction of seismic sections. If there is a map of the

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Some problems in ...

S/169/62/000/009/033/120  
D228/D307

position of the reflecting areas, constructed by means of the method of mass spatial sounding, vertical sections can be plotted in set directions by projecting closely spaced areas onto these directions. [Abstracter's note: Complete translation.] ✓

Card 2/2

3(4,5)  
AUTHOR:

Hontovyy, I.Z. (Gontovyy, I. Z.)

SOV/21-59-7-11/25

TITLE:

Experience of Applying Variometry in the Inner Zone  
of the Forecarpathian Sag

PERIODICAL:

Dopovidi Akademii Nauk Ukrains'koi RSR, 1959, Nr 7,  
pp 745-747 (UkrSSR)

ABSTRACT:

The article deals with results of variometric researches carried out in the inner zone of the Forecarpathian sag. The prospecting possibilities of the variometric method under conditions of the Forecarpathians are determined. Some salt strips and saline sediments are examined, and transversal tectonic breaches for the area between the rivers Stry and Lomnitsa. The research work was supervised by S.I. Subbotin. There is 1 diagram and 1 Ukrainian reference

ASSOCIATION:

Instytut geolohiyi korysnykh kopalyn AN URSR (Institute of Geology of Profitable Stratum)

Card 1/2

SOV/21-59-7-11/25

Experience of Applying Variometry in the Inner Zone of the Fore-  
carpathian Sag

PRESENTED: V.B. Porfir'yev, Member ASUkrSSR

SUBMITTED: January 30, 1959

Card 2/2

GONTOVIY, I.Z. [Hontovyi, I.Z.]

Geophysical study of the upper part of a cross section of the  
inner zone of the Carpathian piedmont fault. Pratsi Inst. geol.  
kor. kop. AN URSR 3:134-139 '61. (MIRA 16:7)

(Carpathian Mountain region--Prospecting--Geophysical methods)

USSR/Cultivated Plants. Potatoes. Vegetables. Melons. M

Abs Jour : Ref Zhur-Biol., No 15, 1958, 68171

Author : Zelengur, N. Ye.; Gontsarchik, I. E.  
Inst : Far Eastern Scientific Research Institute  
of Agriculture.

Title : The Trench Method of Preserving the Pericarps  
of Two-Year Vegetable Crops.

Orig Pub : Byul. nauchno-tekhn. inform. Dal'nevost.  
n.-i. in-ta s. kh., 1957, No 4, 21-24

Abstract : From 1952 to 1956 the Sakhalin Experimental  
Station studied methods of preserving seed  
plants of the Slava cabbage variety, Bordeaux  
beets, Shantene carrots, and Shvedskaya tur-  
nips. In a vegetable storehouse 96.3 percent  
of the cabbage ovaries were preserved; in a  
trench with exhaust pipes and covered with

Card : 1/3

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USSR/Cultivated Plants. Potatoes. Vegetables. Melons. M  
APPROVED FOR RELEASE: 06/13/2000 CIA-RDP86-00513R000516020007-0"

Abs Jour : Ref Zhur-Biol., No 15, 1958, 68171

lathes, straw, and earth, 93.6 percent were  
preserved, and in a trench without exhaust  
pipes and with layers of earth in between the  
cabbages 78.5 percent were preserved. The  
seed yields from the first two variants were  
almost identical (24.2 and 24.9 centners/  
hectare), in the third 22.2, and in the  
last 16.2 centners/hectare. Carrots were  
preserved better in the trench (5 percent  
loss) than in the storehouse (23 percent  
waste); the seed yield from carrot roots  
stored in the trench was 6.69 centners/  
hectare, and from those stored in the vege-  
table storehouse -- 4.67 centners/hectare;  
when turnip and beet seed plants were stored

Card. : 2/3

USSR/Cultivated Plants. Potatoes. Vegetables. Melons. M



GONTSOV, A.G.

Direct current converters for high supply voltage. Prib. 1 tekhn. eksp.  
8 no.2:175 Mr-Ap '63. (MIRA 16:4)  
(Electric current converters)

GONTSOV, I.A.; BRONSHTEYN, G.A.

Methodology of bronchography. Zdravookhranenie 2 no.3:48-49  
Iy-Je '59. (MIRA 12:10)

1. Iz kafedry fakul'tetskoy khirurgii (zav. - prof.D.F.Skripni-  
chenko) Kishinevskogo meditsinskogo instituta i 4 gorodskoy  
bol'nitsy g.Kishineva (glavnyy vrach M.A.Ashumov).  
(BRONCHI--RADIOGRAPHY)

GONTSOV, I.A.

Foreign body in the bronchus as a cause of bronchiectasis.  
Zdravookhranenie 2 no.4:51-52 J1-Ag '59. (MIRA 14:6)

1. Iz kafedry fakul'tetskoy khirurgii (zav. - prof. D.F.Skripnichenko)  
Kishinevskogo meditsinskogo instituta.  
(BRONCHI—FOREIGN BODIES)

GONTSOV, I.A. (Kishinev, ul. S.Iazo, d. 42, kv. 2)

Guided catheter for bronchography with insufflated cuff. Vest. rent.  
1 rad. 34 no.1:70-72 Ja-F '59. (MIRA 12:3)

1. Is kafedry fakul'tetskoy khirurgii (zav. - prof. D.F. Skripnichenko)  
Kishinevskogo meditsinskogo instituta.

(BRONCHI, radiography

bronchography, directed catheter with insufflated cuff  
(Rus))

GONTSOV, I.A.

Case of a schwannoma of the foot. Zdravookhranenie 3 no. 5:64  
S-O '60. (MIRA 13:10)

1. Iz kafedry fakul'tetskoy khirurgii (zav. - dotsent N.Kh.  
Anestiadi) Kishinevskogo meditsinskogo instituta.  
(FOOT—TUMORS)

GONTSOV, I.A.

Clinical characteristics of various forms of chronic suppurative processes in the lungs. Zdravookhranenie 4 no.3: 33-37  
My-Je '61. (MIRA 16:7)

1. Iz kafedry fakul'tetskoy khirurgii (zav.dotsent N.Kh. Anestiyadi) Kishinevskogo meditsinskogo instituta.  
(LUNGS—DISEASES)

GONTSOV, I.A.

Case of suppuration of a giant cyst of the right lung. Zdravookhra-  
nenie 5 no.4:52-53 J1-Ag '62. (MIRA 15:9)

1. Iz kafedry fakul'tetskoy khirurgii (zav. dotsent N.Kh.  
Anestiyadi) Kishinevskogo meditsinskogo instituta.  
(LUNGS—ABNORMITIES AND DEFORMITIES) (CYSTS)

GONTSOV, I.A.

Tracheal bronchus in a patient with multiple abscesses of the right lung. Zdravookhraneniye 6 no.2:59 Mr-Apr'63.

(MIRA 16:10)

1. Iz kliniki fakul'tetskoy khirurgii (zav. - dotsent N. Kh. Anestiyadi) Kishinevskogo meditsinskogo instituta.



GONTSYA, Ya. [Gontea, I.]; SHUTESSKU, P. [Sutescu, P.]; DUMITRAKI, S.  
[Dumitrache, S.]

Human protein requirements during performance of work. Vop.  
pit. 22 no.3:3-8 My-Je '63. (MIRA 17:8)

1. Iz kafedry pitaniya Bukharestskogo mediciko-farmatsevticheskogo  
instituta.

GONTYUROV, I. M.

"The Discovery of a New Potato Variety Resistant to *Epilachna Vigintioctomaculata* Motsch." Cand Biol Sci, All-Union Sci Res Inst of Plant Growing; All-Union Order of Lenin Academy of Agricultural Sciences imeni V. I. Lenin, Leningrad, 1955. (KL, No 13, Mar 55)

So; Sum. No. 670, 29 Sep 55 - Survey of Scientific and Technical Dissertations Defended at USSR Higher Educational Institutions (15)

USSR/Meadow Cultivation.

L

Abs Jour : Ref Zhur Biol., No 14, 1958, 63264

Author : Gonyan, G.G.

Inst : Armenian Scientific Research Institute of Animal Husbandry and Veterinary Medicine

Title : The Effect of Scarification on Germination of the Seeds of Wild Perennial Vetches in Armenia.

Orig Pub : Tr. Arm. n.-i. in-ta zhivotnovodstva i veterinarii, 1957, 2, 275-280

Abstract : In the Armenian University of Animal Husbandry and Medicine Veterinary, there were studied the seeds of the mutative vetch: Fountain (the field dry type), Marmrik and Tsakhkadzor (the forest and forest-steppe type), Lersovkhoz (the meadow-steppe type), Senenov and Kuibyshev (the subalpine type) and Vernashev (subalpine

Card 1/2

USSR/Meadow Cultivation.

L

Abs Jour : Ref Zhur Biol., No 14, 1958, 63264

type). The seed hardness of these vetches is 85-99%, which is explained by the presence of a hard-seed membrane, impervious to water and air. Scarification methods were studied by using finely powdered glass, emery paper (15-minute rubbing), sulphuric acid (10-minute mixing), and by striking a closely-woven-cloth sack containing 1 kg of seeds on a hard level surface. The best scarification method is that of striking the seeds on a hard surface -- the germination of the seeds increased to 98-99%, while the loss due to striking amounted to only 2-2.5% of the beaten seeds. Great quantities of seeds may be scarified by the STS-2 VISKHOM machine, which operates on the basis of the same striking principle. Different ecological forms of the mutative vetch require different amounts of strikes for the increase of seed germination. Recently harvested seeds germinated on the 5-10<sup>th</sup> day, while seeds, after one and one-half years of storage, germinated after 1-3 days. -- V.M. Kashmanova

Card 2/2

GONYAN, G.G.

Biological characteristics of the vetch *Vicia variabilis* Fr.  
et Sint. Izv. AN Arm. SSR. Biol. nauki 14 no.11:3-15 N. '61.  
(MIRA 15:3)

1. Otdel lugov i pastbishch Instituta zhivotnovodstva i  
veterinariii Ministerstva sel'skogo khozyaystva Armyanskoy  
SSR.

GONYAYEV, V. F.

K Voprosu Opredeleniya Vysoty Ustupa (Dliny Linii Zaboya) Gornyy Zhurnal,  
No 7, 1934, Str. 30-32  
ABS In Goryuchiye Slantsy, 1935, No 5, 77

SO:

Goryuchiye Slantsy #1934-35, TN .871  
G .74

HUNGARY

HORVATH, Zoltan, Dr, professor, ROZSAHEGYI, Tibor, Dr, adjunctus, GONYE, Sandor, Dr, assistant professor; Veterinary Medical University, Department of Internal Medicine and Clinic (chairman: HORVATH, Zoltan, Dr, professor, cand. of vet. sci.) (Allatorvostudományi Egyetem, Belgyógyászati Tanszék és Klinika).

"Prevention of Perforative Reticuloperitonitis by Means of a Magnetic Sound."

Budapest, Magyar Allatorvosok Lapja, Vol 21, No 7, Jul 66, pages 302-306.

Abstract: [Authors' English summary modified] After positive ferrosopic findings, a modified Melikszetyan's magnetic bougie that is simple, inexpensive and easy to handle was passed in 76 experimental cattle. In all, 119 sharp metal objects, over 2 cm long and suitable for causing perforation, were removed from 43 animals (56.5 per cent). Probing of short duration was ineffective but 90 metal objects from 26 out of 30 experimental animals were successfully removed by magnetic probing of 24 hours' duration. The effectiveness of the procedure was increased by small doses of parasympathetic stimulants. The procedure was preceded by fasting for 12 hours in every case. The procedure is harmless and can be successfully performed in every animal with the exception of those having esophageal stenosis. Metal

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HUNGARY

HORVATH, Zoltan; ROZSAHEGYI, Tibor; GONYE, Sandor, Budapest, Magyar Allatorvosok Lapja, Vol 21, No 7, Jul 66, pp 302-306

objects imbedded in the wall of the reticulum can not, however, be removed with a magnetic probe. Periodic performance of 24 hour magnetic probing of older cattle is recommended to decrease the number of metal carriers and to remove sharp metal pieces from the reticulum which may cause perforation. 6 Eastern European, 10 Western references.

BELITSKIY, V.; GONZAL'YEZ, E.

Medicine without a prescription; Feuilleton. Za bezop.dvizh. 6 no.  
8:12-13 Ag '63.

BENETSKIY, B.A.; BETIN, Yu.P.; GONZATKO, Ya.

Inelastic scattering of 14 Mev. neutrons on  $Mg^{24}$ . Zhur. eksp. i  
teor. fiz. 45 no.4:927-931 0 '63. (MIRA 16:11)

1. Fizicheskiy institut imeni P.N.Lebedeva AN SSSR.



GONZIK, F. (Ostrava, Chekhoslovatskaya Sotsialisticheskaya Respublika);  
YEZH, B. (Ostrava, Chekhoslovatskaya Sotsialisticheskaya Respublika);  
PAVERA, K. (Ostrava, Chekhoslovatskaya Sotsialisticheskaya  
Respublika)

All-welded dry gasholders. Avtom. svar. 18 no.4:42-46 Ap '65.  
(MIRA 18:6)

LYSAK, G., kand.sel'skokhoz. nauk; GOUGE, M.

Crops preceding spring wheat in Bashkiria. Zemledelie 27 no.4:11-13  
Ap '65. (MIRA 18:4)

1. Baymakskiye opytnoye khozyaystvo.

6005, A.

POLAND / General and Specialized Zoology. Insects. P  
Insect and Mite Pests.

Abs Jour : Ref Zhur - Biol., No 10, 1958, No 4888

Author : Goos, A.

Inst : Not Given

Title : The Nature of Action and the Effectiveness  
of Silica, Azotox and Hoxachlorocyclohexane (HCCH)  
on the Granary Weevil (*Calandra granaria* L.).

Orig Pub : Polskie pismo entomol., 1955 (1956), 25,  
No. 1, 165-191

Abstract : A comparative study in laboratory experiments  
was made of the action of crushed 10% silica at  
10 kg/ton, technical DDT at 0.047-9.5 g/m<sup>2</sup>, 12%  
HCCH and azotox (10% DDT) 1 kg/ton on the weevils  
in grain. Best results (the total destruction  
of the insects a week after treatment) were

Card 1/2

*GOOSEN, K. Ya*  
LIPAYEVA, Galina Alekseyevna; ROZENBERG, Samuil Vul'fovich; GOOSEN, Kira  
Yakovlevna; UDAL'TSOV, A.N., glavnyy red.; SEMKEVICH, I.V., inzh.  
red.

[Resonator installation for measuring dielectrics and magnito-  
dielectrics at 3cm. wave lengths. Overload ammeter] Rezonatornaya  
ustanovka dlia izmereniia dielektrikov i magnitodielektrikov pri  
dline volny 3 sm. Peregruzochnyi ampermeter. Moskva, 1956. 17 p.  
(Pribory i stendy. Tema 5, no.P-56-446) (MIRA 11:3)

1. Moscow. Vsesoyuznyy institut nauchnoy i tekhnicheskoy informatsii.  
Filial.

(Electric resonators) (Ammeter) (Dielectrics)

94-13-7-11/25

AUTHORS: Kriboruchkov, I. I. and Goosen, K. Ya.

TITLE: A New Circuit for Arc Heating of Ingot Heads  
(Novaya skhema dugovogo obogreva pribyley slitkov)

PERIODICAL: Promyshlennaya Energetika, 1958, Vol 13, Nr 7, pp 29-30

ABSTRACT: Arc heating of the upper parts of ingots is often used in order to cut down the volume of cooling pits. A carbon electrode is installed above the mould full of molten metal. Automatic control is required to make the arc burn evenly. Existing installations have a number of defects; they require a furnace transformer, air-cored chokes, a ventilated machine room and constant operating staff. This article describes a reliable and economic equipment that the authors have devised for this purpose. The installation, illustrated diagrammatically in Fig.1, consists of a transformer chamber and a number of panels for automatic equipment and contactors. Welding sets are used for the arcs. Fig.1 illustrates an installation for syphon pouring of steel for ingots of up to 500 kg. However, the same circuit can be used for larger ingots. In order to obtain high quality ingots the arc must be suitably controlled. The control

Card 1/2

A New Circuit for Arc Heating of Ingot Heads

94-13-7-11/25

circuit of the motors used to drive the electrodes is given in Fig.2. It employs two magnetic amplifiers operating in relay conditions. The construction of the equipment and the method of operation are described. If the arc current is too high the electrodes is moved in one direction, if it is too low in the other. The current sensitivity of the regulator is of the order of 10-12% which is found to be adequate. During a heating cycle of ten minutes the electrodes are moved not more than fifty times. The circuit has been tested in production and is recommended for more extensive use. Its main advantages are that it can be applied to ingots of any size, the electrodes can be driven by a squirrel cage induction motor, d.c. not being required, and there is no need for special machine rooms for converters or other machinery. There are 2 figures.

ASSOCIATION: Tyazhpromelektroproyekt [State Design and Planning Institute (for heavy electrical industry)]

- Card 2/2
- |                                     |                                    |
|-------------------------------------|------------------------------------|
| 1. Electric arcs - Applications     | 2. Electric arcs - Control systems |
| 3. Carbon electrodes - Applications | 4. Industrial plants - Equipment   |

SARI, Balint, dr.; GOOZ, Katalin, dr.; DAN, Sandor, dr.

Photometric determination of serum beta-lipoproteins with the  
Birstein and the Frie-Hoefflmayr methods. Orv. hetil. 106 no.16:  
743-744 18 Ap '65

1. Debreceni Orvostudományi Egyetem, I. Belklinika (igazgató:  
Fornet, Bela, dr.).

GOOZ, L.

The West-European oil pipelines. Foldr kozl 12 no.4:382-384  
'64.



HUNGARY

GCOTIS, László, Dr, veterinary specialist (szekallatorvos), chief (vezető); Ambulant Veterinary Service (Allatorvosi Rendelőintézet), Gyöngyös.

"Enhancement of Weight Gain of Pigs with Substances Affecting the Level of Blood Sugar."

Budapest, Magyar Allatorvosok Lapja, Vol 18, No 1, Jan 63, pp 23-26.

Abstract: [Author's English summary modified] The weight gain of pigs may be enhanced by substances lowering the blood sugar level. Insulin and Eucarbon (N-sulfanil-N'-butylcarbamide) caused a change in the neuro-endocrine activity of the organism and as a consequence of this change the appetite and weight gain of the pigs increased. Daily doses of 20-25 IU [International Units] of insulin or 0.5-0.7 g of Eucarbon sufficed to show the effect. The enhancement of the weight gain was one-third of the gain shown by control animals. Eight Hungarian references.

h/1

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GOOZ, Lajos

Sight-seeing in London. Elet tud 16 no.39:1231-1235 24 8 '61.

~~GOOZ. Laioz~~

New York, the 20th-century Babel. Pt.1. Elet tud 18  
no.18:558-563 5 My '63.

GOOZ, Lajos

New York walks. Pt. 2. Elet tud 18 no.19:599-602 12 My '63.